

A Preliminary Investigation on Identification of Lamé Dairy Cattle Using Pedometer Measures

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Introduction

Lameness is a clinical diagnosis, obtained by observing moving cows and comparing the locomotion to a generally accepted scale. Electronic surveillance may facilitate identification of lameness in cows and may identify cows for further physical examination. Currently, pedometer (activity) systems are promoted for use as an estrus detection aid on dairies. The objective of this project was to determine the provisional utility of activity data in identifying clinical lameness in dairy cows. The research hypothesis was that activity measures are reduced in lame cows.

Materials and Methods

A single university herd composed of 120 Jersey and Holstein cows was used for this study. Each cow was identified with an ear tag, and all cows wore an activity monitor (Afiact, SAE AFIKIM) which monitored cow movement. Twice daily at milking, activity data was transferred into a central database, and activity was calculated as steps per hour over the day. Cows in this study were housed in a free-stall barn.

Cows were lameness-scored approximately once monthly commencing September 2005 using the Sprecher method. This method scores lameness on a 1 to 5 scale, with 1 being sound and 5 being down or very reluctant to move. The method was slightly modified, as cows were scored only while in motion. At each observation period, cows with lameness scores ≥ 3 were categorized as lame.

For each cow, activity data from the five consecutive days prior to the day of scoring was averaged and used as a single "Average Activity" variable for the analysis. Data from the actual day of lameness scoring were not included in this calculation.

A descriptive analysis of average activity and comparison with clinical lameness score was conducted. Though some cows were lameness-scored multiple times, all observations were considered independent for this report.

Results

The prevalence of lameness in this herd was approximately 25%. Graphical analysis indicated that the distributions of lame and non-lame cows overlapped. Of all lame cows, more than 50% had activity levels in the lower tercile (<120 steps per hour). However, approximately 25% of non-lame cows were also observed to reside within the lower tercile.

Significance

Use of the commercial activity monitor described here had a limited ability to accurately diagnose lameness in this herd. There was no attempt to remove activity associated with estrus in this data. Herd-specific factors, including lameness prevalence, facility design and size, may alter the utility of this measure. The use of activity as applied here may be useful in screening herds for lameness, and this monitor should be further investigated in multiple commercial herds.